INTERNATIONAL CLASSIFICATION OF ECOLOGICAL COMMUNITIES

U.S. Ecological Systems of Coastal South Carolina and the Francis Marion National Forest

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NatureServe
A Network Connecting Science With Conservation

Presentation Summary

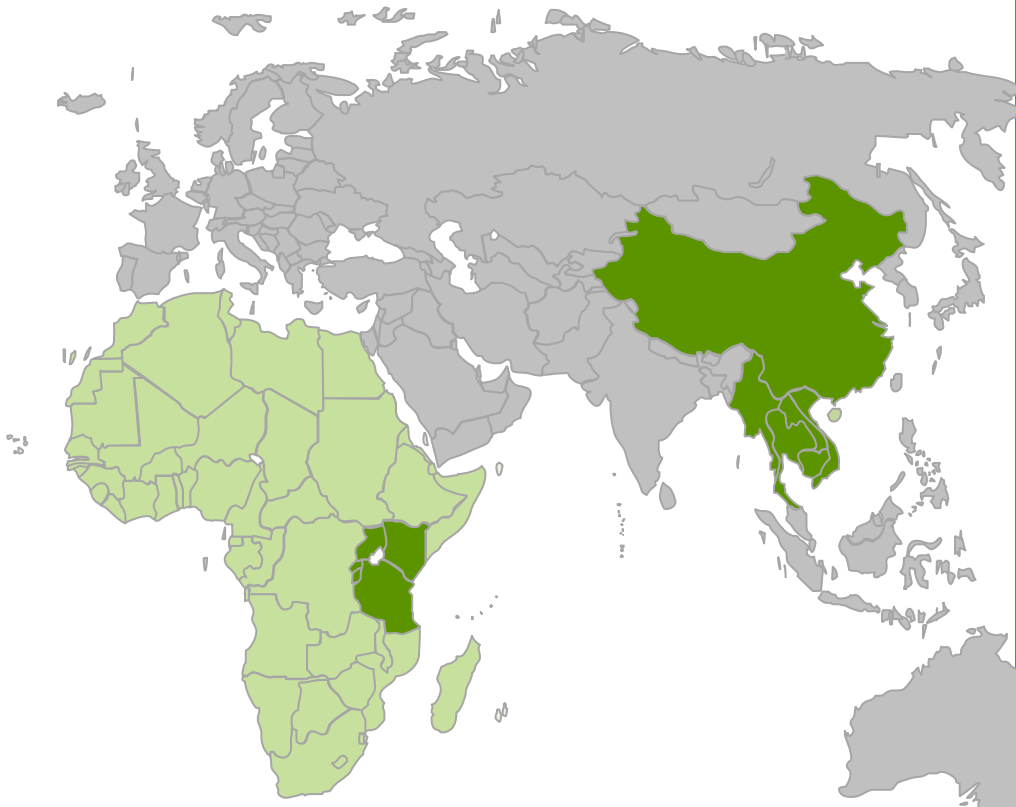
- Introduction – what is NatureServe?
- Why community conservation?
- Why a standard classification?
- What is the Ecological Systems Classification?
- Some issues in the Francis Marion
- Moving forward (next steps)…

What is NatureServe and the Natural Heritage Network?

- NatureServe is a non-profit conservation organization that provides the scientific information and tools needed to help guide effective conservation action.
- NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems.
- An international network of biological inventories - natural heritage programs or conservation data centers - active in all 50 U.S. states, Canada, Latin America, and Caribbean

A global network connecting science and conservation

Anahi holding Black-faced Brush-finch, Peru
Photo by Bruce Young



NatureServe data center network

Major NatureServe project areas

NatureServe conservation mapping areas

The NatureServe Network -- Natural Heritage Programs:

- Gather biodiversity information (community and species) and maintain it in standard databases
- Work with national and subnational agencies and other organizations to conserve biodiversity
- Are active in all U.S. states, most Canadian provinces, parts of Latin America
- Have documented over 50,000 occurrences of high quality communities in (or crosswalked to) the US National Vegetation Classification and/or the Ecological Systems Classification

Conservation of ecosystems and communities -- the “coarse filter”

- Emphasis on whole systems, processes, and patterns – a broader unit of conservation
- Promotes conservation of less imperiled species, not just the endangered ones
- Promotes conservation of unknown species, not just the known
- Applicable where we have only more general knowledge of the communities and their composition
- “Coarse filter,” not “crude” -- the more precisely we can understand community diversity, the better we can conserve it

Durham Ecology Program — Francis Marion National Forest Collaboration

- 2000-2002 – Vegetation Classification and community descriptions for Southeast Region (R8)
- Ca. 2000-2007 Carolina Vegetation Survey plot sampling
- 2009 – Additional Vegetation classification work for Longleaf Pine communities, with partners
- 2011 – Field testing of Ecological Integrity Criteria for Longleaf Pine-dominated stands (Region 8)
- 2012 – Field work with NCASI Project on rare plant habitat classification and verification

Durham Ecology Program — Francis Marion National Forest Collaboration

- 2012-2013 – review and improvement of Ecological Systems descriptions, including better local information
- 2012-2013 – review and improvement of global status ranks and habitats for rare plants
- 2012-2013 – field key, site verification, data collection, and technical advice in support of Ecological Systems mapping of the Francis Marion

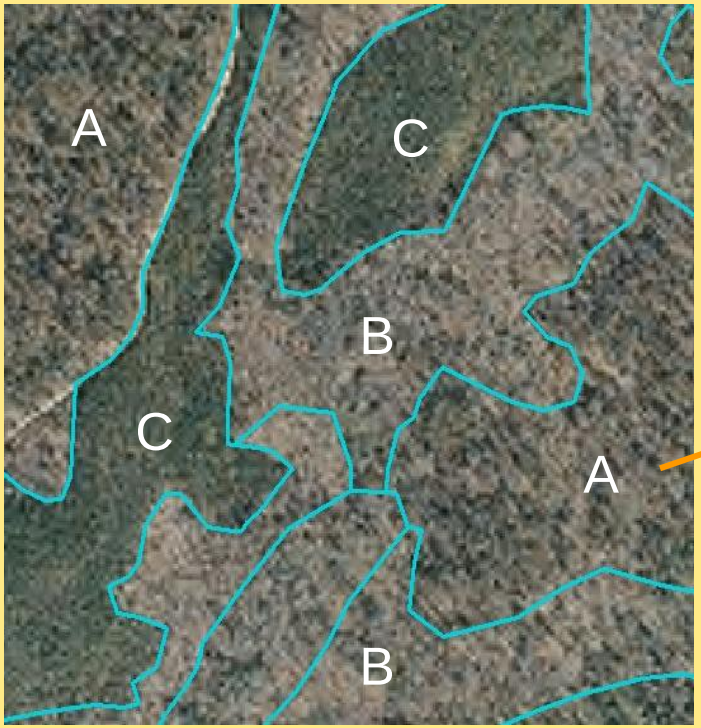
Forest Planning Process

- As part of the Forest Planning process, we are looking at a landscape that includes both terrestrial and aquatic systems
- NatureServe's Ecological Systems represent the terrestrial components of this process

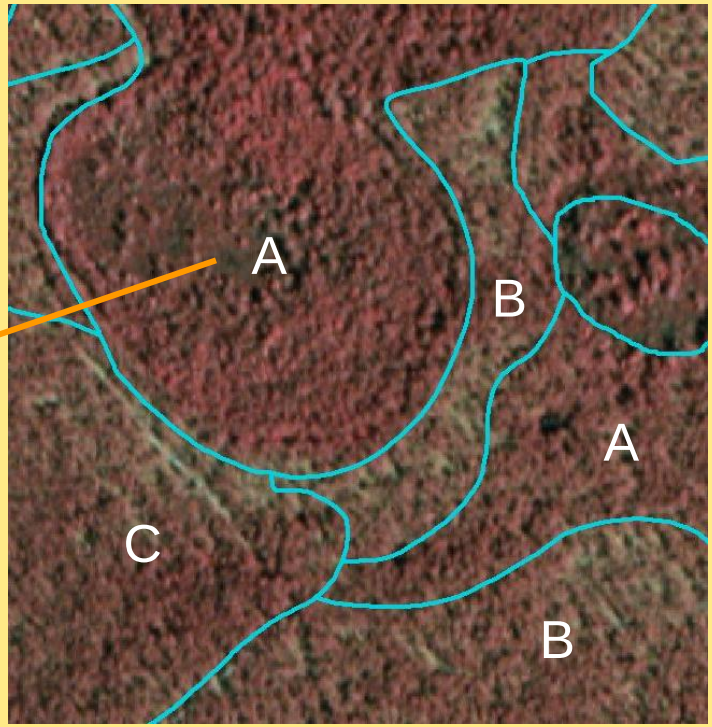
An ideal ecological Classification should be:

- Consistent (names and concepts)
- Comprehensive
- Applicable at various scales
- Applicable with varying amounts of information
- Useful for mapping, modeling, evaluating habitat quality, threats

Consistent Concepts and Names



Same
or Different?



Park X

Park Y

What do we mean by Standard?

The Terrestrial Ecological System Classification:

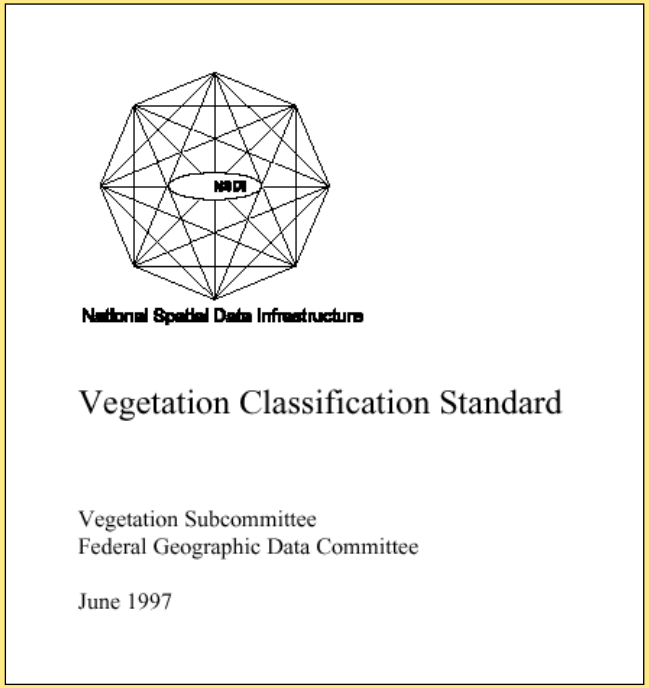
- Adopted by Interagency LANDFIRE, SE GAP Analysis
- Adopted by Andes-Amazon Moore Foundation Project

US National Vegetation Classification (US-NVC):

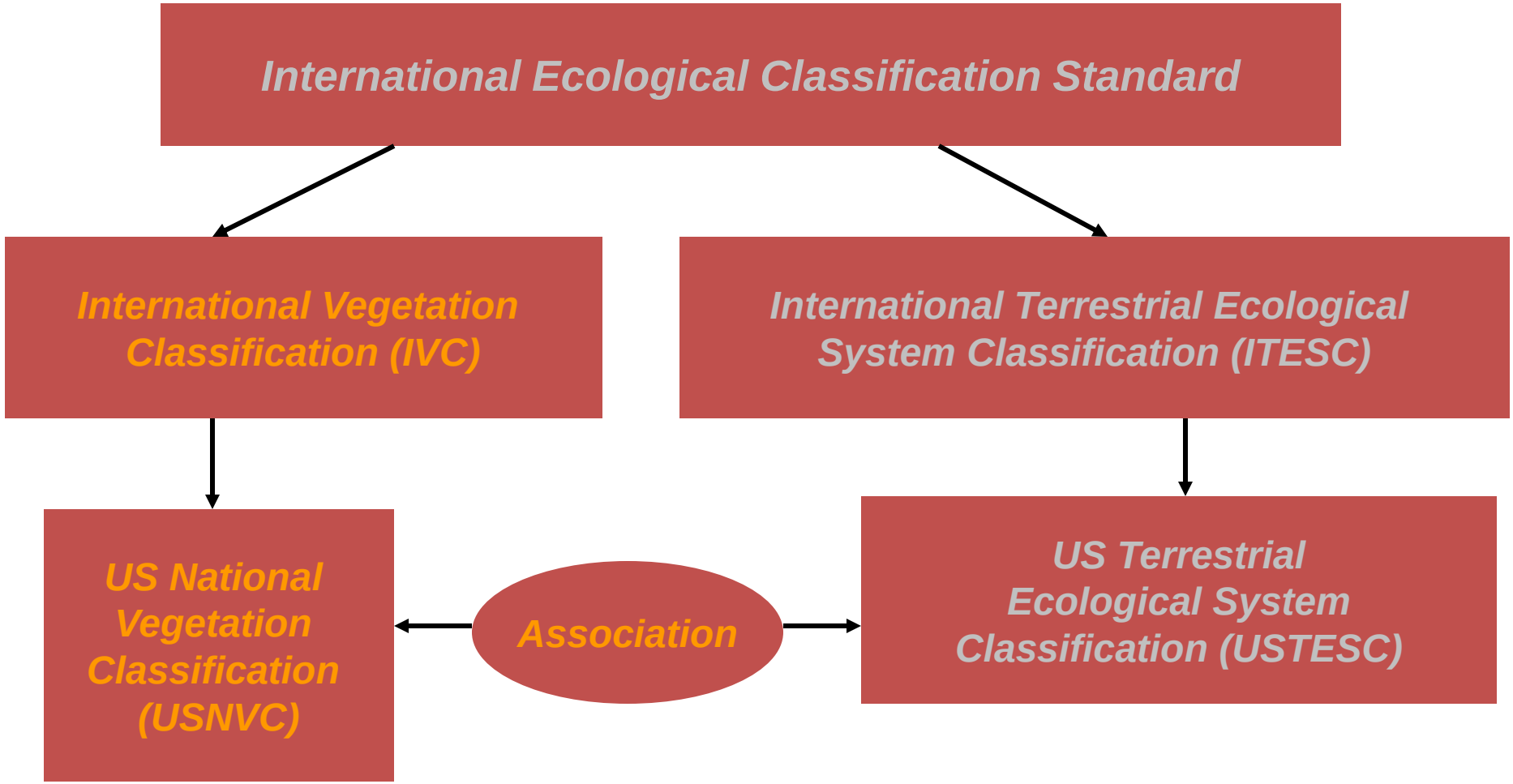
(detailed Vegetation Types)

Adopted by:

- *Ecological Society of America* (ESA) – Floristic Unit Standards
- [U.S.] *Federal Geographic Data Committee* (FGDC) - Overall Vegetation Classification Standards



Types of Ecological Classifications (Developed by NatureServe)



Ecological Classification — Key Components

- Major Systems
- Life Form and Structure
- Plant species composition
- Physical Environment and Processes
- Species Relationships
- Developed from existing information

Development of the Systems Classification

Created from existing:

- Classifications (state, local, other)
- literature
- discussions with experts

Evaluated for gaps and weaknesses

Refined through analysis and integration of new data

Guides further data acquisition

Scales of Ecological Classification

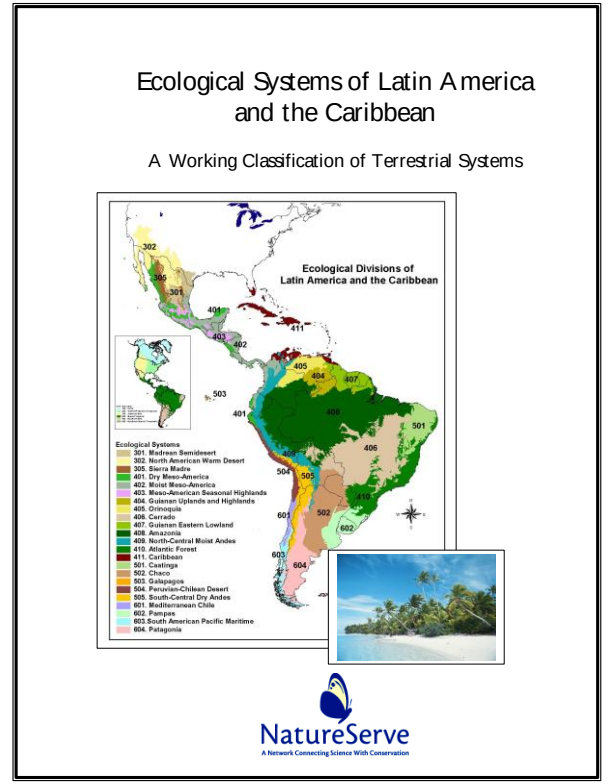
(number of types in Francis Marion NF)

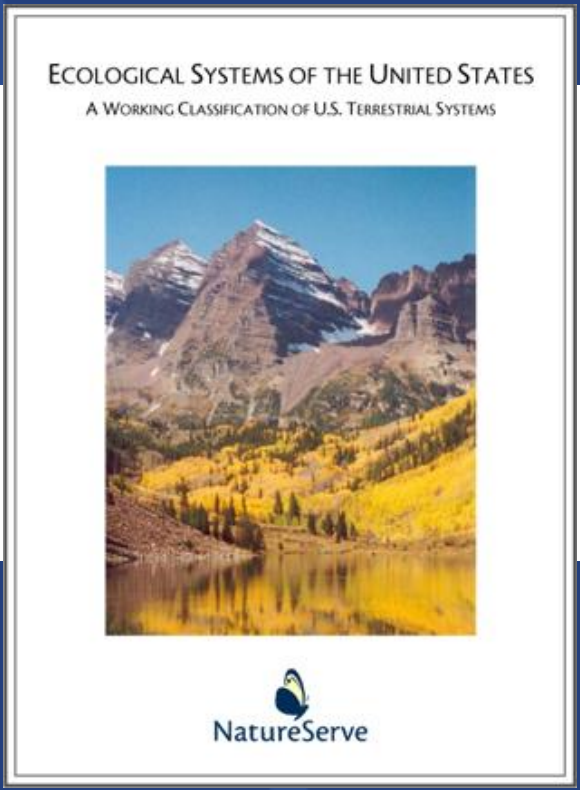
→ Ecological Systems (ca. 700 in lower 48 US, 19 in FRMA)

→ US-NVC association (ca. 7000 in lower 48 US, ca. 80 in FRMA)

TERRESTRIAL ECOLOGICAL SYSTEMS

Groups of associations that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients.



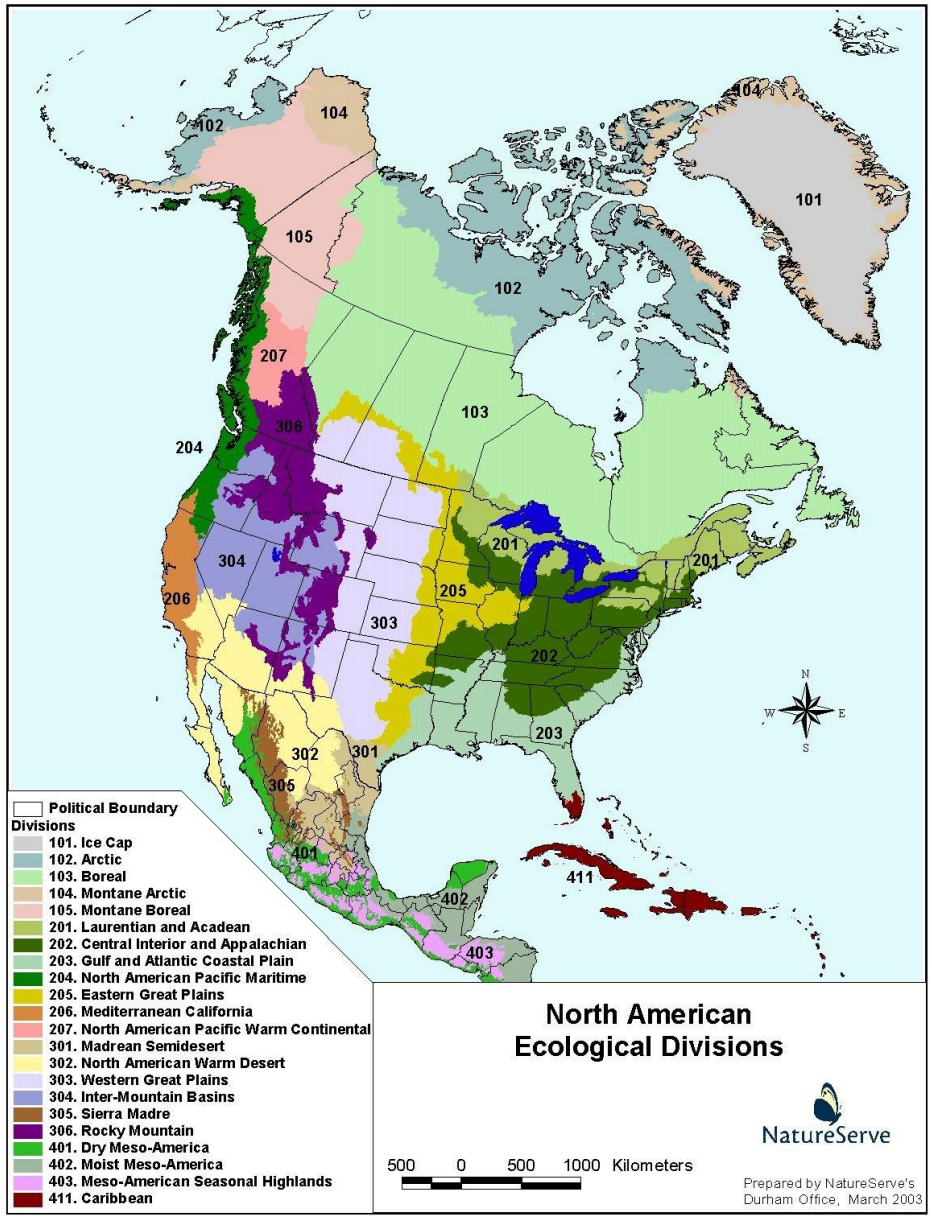


NatureServe's Ecological Systems

- Ecological Systems are a national, mid-level classification
- They relate vegetation patterns to local environment within landscapes and integrate spatial (soil, hydrology) and temporal (successional) patterns of the component vegetation communities
- Have more-or-less intuitive, colloquial names

NatureServe's Ecological Systems

- Broad units for planning and habitat characterization - related rare plants and animals – promoting ecosystem management
- Useful in land and resource management planning, mapping, integrity criteria
- Standard data includes vegetation structure and composition, disturbance regimes, biogeography, ecological dynamics, and landscape position.



Standard Nomenclature:

1. Name of the Ecological Divisions or nested Provinces that describe the distribution of the type.
2. Characteristic vegetative composition and physiognomy
3. Environmental modifiers

"S. Coastal Plain Mesic Slope Forest"
"S. Atl. C. P. Wet Pine Sav. & Flatwoods"
"S. Coastal Plain Nonriv. Basin Swamp"

Longleaf Pine Systems

- CES203.281 - Atlantic Coastal Plain Upland Longleaf Pine Woodland
- CES203.536 - Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods

Upland and Maritime Hardwoods

- CES203.476 - Southern Coastal Plain Mesic Slope Forest
- CES203.241 - Southern Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest
- CES203.261 - Central Atlantic Coastal Plain Maritime Forest

Bottomland Hardwoods and Cypress-Tupelo Forests

- CES203.066 - Southern Atlantic Coastal Plain Large River Floodplain Forest
- CES203.249 - Atlantic Coastal Plain Small Blackwater River Floodplain Forest
- CES203.247 - Atlantic Coastal Plain Blackwater Stream Floodplain Forest
- CES203.240 - Southern Atlantic Coastal Plain Tidal Wooded Swamp

Nonriverine Forested Wetlands

- CES203.384 - Southern Coastal Plain Nonriverine Basin Swamp
- CES203.245 - Atlantic Coastal Plain Clay-Based Carolina Bay Wetland
- CES203.304 - Southern Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest
- CES203.252 - Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin and Baygall
- CES203.252 - Atlantic Coastal Plain Peatland Pocosin and Canebrake

Herbaceous Wetlands

- CES203.262 - Southern Atlantic Coastal Plain Depression Pond

Tidal Marshes

- CES203.376 - Southern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh
- CES203.270 - Southern Atlantic Coastal Plain Salt and Brackish Tidal Marsh

A systems question: CES203.245 - Atlantic Coastal Plain Clay-Based Carolina Bay Wetland

- Questions arose about the application of this type in the Francis Marion National Forest
- What soil characteristics lead to the impeded drainage? (is there always “clay”)
- How is this related to the “Cypress Savanna” vegetation type?
- Is the concept based in the Carolina Bay landform or in a particular vegetation type in a subset of Carolina Bays?
- Some clarification is clearly needed…

What have we learned:

- Field observations, additional sources, and consultation with partners indicate that “Clay-based” Bay is a misnomer
- Carolina Bays with “Cypress Savanna” and related vegetation may have other mineral soils, with some mechanism of impeded drainage
- Carolina Bays with “pocosin” evergreen shrub vegetation are classified with other pocosins
- This System will be renamed “Atlantic Coastal Plain Mineral Soil Carolina Bay Wetland (Cypress Savanna)” (or something like that)

Additional Issues:

- There are several different non-riverine forested wetlands on the Francis Marion
- “Basin Swamp”; “Nonriverine Swamp and Wet Hardwood Forest”; “Peatland Pocosin and Canebrake”
- There are issues with their delineation and mapping, which are being resloved

Future Directions

- Seeking additional support to refine and implement Longleaf Ecological Integrity work (multi-agency)
- Review and improve Ecological Systems Classification for Sumter National Forest

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